

Abstract

Title: Polyethylene molding material and pipe produced therewith with improved mechanical properties

The invention relates to a polyethylene molding material having a bimodal molecular weight distribution which has an overall density of $\geq 0.948 \text{ g/cm}^3$ and a melt flow index $\text{MFI}_{190/5}$ of $\leq 0.2 \text{ dg/min}$. It comprises an amount of from 35 to 65% by weight of low-molecular-weight ethylene homopolymer A which has a viscosity number VN_A in the range from 40 to 90 cm^3/g , a melt flow index $\text{MFI}_{190/2.16 A}$ in the range from 40 to 2000 dg/min and a density d_A of $\geq 0.965 \text{ g/cm}^3$, and an amount of from 35 to 65% by weight of high-molecular-weight ethylene copolymer B which has a viscosity number VN_B in the range from 500 to 2000 cm^3/g , a melt flow index $\text{MFI}_{190/5 B}$ in the range from 0.02 to 0.2 dg/min and a density d_B in the range from 0.922 to 0.944 g/cm^3 . The fraction of the molding material according to the invention obtained during a preparative TREF analysis at a temperature of $78^\circ\text{C} \pm 3 \text{ K}$ using p-xylene has an average molecular weight of $\geq 200,000 \text{ g/mol}$.

The invention also relates to a high-strength pipe produced from the molding material according to the invention which has a stress cracking resistance of $\geq 1500 \text{ h}$, a fracture toughness of $\geq 9 \text{ MJ/mm}^2$ and a flexural creep modulus, measured in accordance with DIN 54852-Z4, of $\geq 1350 \text{ N/mm}^2$. It is particularly suitable for the transport of gases and water.